DOCUMENT RESUME

ED 037 786 CG 005 191

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TITLE The Relevance of Testing Aptitude--Treatment Interactions for Counseling Research.
INSTITUTION American Educational Research Association, Washington, D.C.; American Institutes for Research, Washington, D.C.
PUB DATE 3 Mar 70
NOTE 9p.; Paper presented at American Educational Research Association Convention, Minneapolis, Minnesota, March 2-6, 1970

EDRS PRICE EDRS Price MF-$0.25 HC-$0.55
DESCRIPTORS Counseling, *Counseling Effectiveness, Counseling Goals, *Evaluation Techniques, *Guidance Objectives, Improvement, Interaction, *Longitudinal Studies, *Research Design, Research Problems

ABSTRACT

Outcome research in counseling has generally overlooked the problem that main effects of treatment may have little meaning in the presence of interactions, and that variables not represented in research designs have no opportunity to demonstrate their interactive effect. Comparison of several groups in terms of mean differences or average gains, tells little about change in individual performance. Experimental-longitudinal projects that involve a small number, several time extended treatments that focus on continuously monitoring the performance of each subject on a variety of criterion variables are desirable since they increase the likelihood of answering aptitude x-treatment interaction questions. A greater variety of research strategies must be utilized to create and empirically evaluate specific treatments for particular clients-especially those which combine the rigor of the experiment, the relevance of the intra-individual replication study, and the richness of the longitudinal project. (KJ)

ED037786

THE RELEVANCE OF TESTING APTITUDE - TREATMENT INTERACTIONS FOR COUNSELING RESEARCH

A paper presented at the annual meeting
of the
American Educational Research Association

March 3, 1970

Minneapolis, Minnesota

by

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American Institutes for Research

CG005191

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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THE RELEVANCE OF TESTING APTITUDE - TREATMENT INTERACTIONS FOR COUNSELING RESEARCH

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The need for comprehensive, multi-dimensional strategies in counseling research is becoming increasingly clear. Research designs have been called for that permit inductive inferences about the comparative effects produced by alternative and competing experimental treatments (Platt, 1964; Krumboltz, 1967); that utilize a variety of criterion measures employed not only on a pre- and post-treatment basis but also at periodic intervals during treatment (Paul, 1967; Thoresen, 1969); and that generate a body of data leading to the stating and testing of subsequent research hypotheses. Outcomes of studies employing these features should provide a host of specific answers to the question, "What treatment by whom is most effective for this individual with that specific problem?" (Thoresen, 1969). There is a growing awareness among counseling researchers, however, that a particular phrase in this question, "for this individual," has not been given enough attention in the descriptions of comprehensive research strategies (Whiteley and Allen, 1969). This paper will discuss the current status as well as future prospects of research designs that allow for the testing of individual difference x treatment interactions.

STATUS OF APTITUDE X TREATMENT INTERACTION RESEARCH

Sprinthall (1968) reviewed the few available empirical studies (e.g., Volsky et al, 1965) on the subject of relating particular subject characteristics to specific treatments in terms of given outcome measures, and some

related expository statements of counseling researchers (e.g., Kiesler, 1966).

Volsky reported the results obtained from using such outcome measures as "problem-solving," "defensiveness," and "anxiety." On these measures, he found considerable variation within groups of subjects receiving the same treatment. Some subjects increased their scores on these measures while almost an equal number of other subjects, within the same treatment group, actually produced decrements in scores. Although between group comparisons based on mean scores yielded few significant differences, there were at least some subjects for whom the treatment was particularly efficacious. Inquiry that focuses on the alteration of group means, however, does not usually help us to identify and to explain changes in individual performance. Stated differently, two subjects exposed to the same universal treatment are apt to differ more in how fast and how much they learn than they would if each one were treated by a different method especially tailored to each subject's particular pattern of abilities (Jensen, 1969).

Kiesler (1966) underscored the contention that future research efforts must assess subject differences within experimental groups before the start of treatment; thereby challenging the assumptions of homogeneity within an experimental group. Since subjects are likely to show a range of differences on almost any measure of human performance, he argued, pre-treatment differences among subjects make it difficult to draw meaningful conclusions from the results of experimental treatments. In other words, a given treatment is likely to have a differential effect on subjects in an experimental group depending on the pre-treatment differences among those subjects. Kiesler recommended using designs that dichotomize groups on variables presumed to relate to treatment outcomes, or statistical methods

of adjusting for pre-treatment variance within groups such as analysis of covariance. While such methods may facilitate drawing causal inferences between treatment and outcome, they do not help to identify what treatments are most effective with which types of subjects; data that would be particularly useful to counseling therapists as well as to developers of guidance curricula.

Following an exhaustive review of the literature dealing with human learning, the psychology of individual differences and classroom instructional variables, Cronbach and Snow (1969) concluded that there is only scattered empirical evidence supporting the existence of aptitude x treatment interactions. Despite the paucity of empirical data, Cronbach has not given up hope that the interaction model will eventually provide useful information both to teachers and to counselors. In his judgment, most research of this type in the past has led to mixed results, either because the questions were not well stated or because virtually identical inquiries have often yielded different outcomes. As a preferred experimental strategy, he suggests that researchers attempt to "invent interactions." Specifically he proposed that "we ought to take a differential variable we think promising and design alternative treatments to interact with that variable." (Cronbach, 1967, p. 32). Reliable and useful information is obtained from such studies, he argued, when the regression line relating aptitude to outcome under one treatment crosses the regression line for the competing treatment. I would like to turn now to a recent counseling inquiry that employed Cronbach's strategy in an attempt to relate a cognitive style variable and a personality variable to the outcomes of contrasting experimental treatments.

A RESEARCH EXAMPLE

A recent study undertaken by a group of counseling researchers at Stanford University attempted to measure the differential effects of two alternative and competing group counseling treatments, designed to encourage career exploratory behaviors. Ninety-six 11th grade male students, stratified by perceptual orientation (field independence-dependence) and personality type (introversion-extraversion), were randomly assigned in three schools to two experimental treatments: (1) video peer social modeling, and (2) structured group interaction using written stimulus materials. Criterion variables included: (1) knowledge of how to obtain and to use career information; (2) identification and use of a variety of information in a simulated career exploration situation; and (3) frequency and variety of career exploratory behaviors performed by subjects outside the treatment setting. (A more thorough description of the research design, the experimental treatments, the strategy employed in selecting the predictor variables, the outcome measures and the data analysis techniques will be presented in the other symposium papers by Norman W. Robinson and Bruce W. Bergland.)

The findings of the study showed that the predictor information did not interact significantly with the treatments, i.e., subject differences in perceptual performance and personality type did not correspond to differences in treatment effects. Because of various difficulties with the design, a conclusion of no relationship between the predictor variables used and the results of treatment would be premature. The study, however, did raise serious questions about appropriate research design and strategy when aptitude x treatment interactions are sought.

1. The results were inconsistent across the three schools and marked variations were found within treatment groups. Little is known about why a particular treatment was effective (or ineffective) with a certain subject. In retrospect the study used an overly complex, multivariate design. The complexity involved in examining interaction effects of client characteristics, treatment factors and outcome measures demands much greater experimental control than was exercised. Too many uncontrolled variables were operative in the three high school field settings involved. Subjects, for example, drawn from interested eleventh grade males, may have been quite different in terms of their career development and vocational exploratory experiences. Future studies should select subjects who are more alike on criterion (and other) variables to increase the probability of finding interactions, if there are any, between perceptual and personality variables and the effects of treatments designed to stimulate career exploration.

2. Greater control is needed in pinpointing and simplifying the ingredients of treatment. The present study used a variety of presentational forms (pictorial, symbolic, verbal) and subject response forms (covert, vocal, motoric, selective) in treating subjects. Tosti and Ball (1969), for example, have argued that examination of interactive effects in instruction are typically confounded by failure to distinguish presentational form, medium and content. This study presented a complex of presentational forms, mediums and types of content that may have interacted in uncontrolled ways with subjects, possibly blurring the effects of subject characteristics with these complex treatments.

3. A related question concerns the overt and covert behaviors of subjects during treatment sessions and outside treatment for the treatment period. It seems mandatory that studies, investigating the interactive

effects of such variables as subject characteristics, particular treatments and multiple outcome measures, use pre-treatment as well as "in treatment" continuous assessment techniques to gather data on how subjects are reacting throughout all phases of the study (Thoresen, 1969). Such information will enable investigators to know what is happening with each subject from the very beginning. Pinpointed cumulative data on each subject is needed to understand how interaction factors influence outcome measures (Sidman, 1960). Large N factorial designs using "one time" between group mean difference comparisons (or pre-post mean contrasts) do not provide the continuous data on individual subject behaviors that is required.

SUMMARY

Outcome research in counseling has generally overlooked the problem that main effects of treatment may have little meaning in the presence of interactions, and that variables not represented in research designs have no opportunity to demonstrate their interactive effect. Comparison of several groups in terms of mean differences or average gains tells little about change in individual performance. Experimental-longitudinal projects that involve a small N, several time extended treatments, and that focus on continuously monitoring the performance of each subject on a variety of criterion variables are desirable since they increase the likelihood of answering aptitude x treatment interaction questions. A greater variety of research strategies must be utilized to create and empirically evaluate specific treatments for particular clients--especially those which combine the rigor of the experiment, the relevance of the intra-individual replication study, and the richness of the longitudinal project.

March 3, 1970

Counseling Research: Effects of Aptitude-Treatment Interaction Variables

Discussion Questions

1. Treatment design

   a. Interactions cannot appear unless treatments are designed with sufficient power to produce measureable results. How can this best be done?

   b. Interactions will not become visible unless competing treatments are designed to be distinctly different. What guidelines are available for the treatment design phase of a study?

2. What improvements need to be made in criterion measures to make them suitable for interaction studies?

3. What are the most appropriate procedures for selecting individual different variables in interaction studies?

4. What does the current status on aptitude-treatment interaction studies portend for counseling research?

5. What are the strengths and weaknesses of alternative ways to analyze interaction data?

6. What are the implications of small N, repeated measurement designs for testing interactions in counseling research?

7. Other _____

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